Amendments to the Claims:

Cancel claims 1-5, amend claims 6, 12-13, 17, 19-21, 30, 31, 33-34 and 35, and add new claims 36-39. This listing of claims will replace all prior versions and listings of the claims in the application.

Claims 1-5 (Cancelled).

6. (Currently Amended) A spectral resolving system comprising:

an entrance slit structure having an entrance slit extending in a first direction for receiving a beam of light having a photon flux within a predetermined spectral pass band;

a beam shearing system including:

a beam splitter <u>on the surface of a prism that is</u> aligned at an angle to the first direction so that the received beam of light is split into two separate beams;

<u>an air gap adjacent the surface of the prism on which the beam splitter is located;</u>

a reflective subsystem having a plurality of reflective surfaces defining separate light paths of equal optical path length for the two separate beams, the reflective surfaces arranged such that when the two beams emerge from the beam shearing system they contain more than 50 percent of the photon flux and the chief rays of the two separate beams are substantially parallel to each other; <u>and</u>

<u>wherein the angle at which the beam splitter is aligned is less than the critical angle above which total internal reflection of a portion of the beam of light occurs;</u> and

an optical system configured to recombine the two separate beams of light emerging from the beam shearing system onto an exit pupil.

7. (Previously Amended) The spectral resolving system of claim 6 wherein the optical system is also configured to recombine the separate beams of light emerging from the beam shearing system to create an image substantially perpendicular to the exit pupil plane.

8. (Previously Amended) The spectral resolving system of claim 7 wherein:

the optical system has an optical axis;

the exit pupil is located in one of the group consisting of a tangential plane and a sagittal plane relative to the beam shearing system;

the image is located in the other of the group consisting of a tangential plane and a sagittal plane relative to the beam shearing system; and

the exit pupil and the image are located at substantially the same position along the optical axis.

9. (Previously Amended) The spectral resolving system of claim 6 wherein the optical system is telecentric in object space, where the object of the optical system is the entrance slit.

10. (Previously Amended) The spectral resolving system of claim 6 wherein the optical system is anamorphic.

11. (Previously Amended) The spectral resolving system of claim 6 wherein the optical system cancels aberrations when it recombines the two beams of light that emerge from the beam shearing system.

12. (Currently Amended) A static interferometer comprising:

fore-optics having a chief ray and a ~~an asymmetric~~ pupil that is asymmetric relative to the chief ray and configured to collect light and focus it into a beam;

a spectral resolving system comprising:

an entrance slit structure having an entrance slit extending in a first direction for receiving a beam of light;

a beam shearing system including:

a beam splitter aligned at an angle to the first direction configured to split the received beam of light into two separate beams;

a reflective subsystem having a plurality of reflective surfaces defining separate light paths of equal optical path length for the two separate beams, the reflective surfaces arranged such

that when the two beams emerge the chief rays of the two separate beams are substantially parallel to each other; and

an optical system configured to recombine the two separate beams of light emerging from the beam shearing system onto an exit pupil.

13. (Currently Amended) A static interferometer comprising:

fore-optics having a chief ray and a pupil that is asymmetric relative to the chief ray and configured to collect light and focus it into a beam;

a spectral resolving system comprising:

an entrance slit structure having an entrance slit extending in a first direction for receiving a beam of light;

a beam shearing system including:

a beam splitter aligned at an angle to the first direction configured to split the received beam of light into two separate beams;

a reflective subsystem having a plurality of reflective surfaces defining separate light paths of equal optical path length for the two separate beams, the reflective surfaces arranged such that when the two beams emerge the chief rays of the two separate beams are substantially parallel to each other; and

an optical system configured to recombine the two separate beams of light emerging from the beam shearing system onto an exit pupil; and ~~The static interferometer in claim 12, further comprising~~ a detector located at the exit pupil.

14. (Previously Amended) The static interferometer in claim 13 wherein the detector is configured to record pixels of incident radiation intensity.

15. (Previously Amended) The static interferometer in claim 14 further comprising:

a data processing system connected to the detector; and

wherein the data processing system performs Fast Fourier Transforms on the digitized measurements to obtain the spectral composition of the incident radiation.

16. (Previously Amended) The static interferometer in claim 14 further comprising:

a data processing system connected to the detector; and

wherein the data processing system convolves the measurements with filters to detect the presence or absence in the spectrum of the incident radiation of frequencies of radiation characteristically emitted or absorbed by particular substances.

17. (Currently Amended) The static interferometer in claim ~~12~~13, wherein the two beams of light are recombined to form a single sided interferogram at the exit pupil.

18. (Previously Amended) The static interferometer in claim 17 wherein the reflective surfaces of the reflective subsystem are configured such that when the two beams emerge from the beam shearing system they contain more than 50 percent of the photon flux of the received beam of light.

19. (Currently Amended) The static interferometer in claim ~~12~~13, wherein the chief ray of light collected by the fore-optics is substantially to one side of the optical axis of the beam formed by the fore-optics.

20. (Currently Amended) The static interferometer in claim ~~12~~13, wherein the fore-optics are telecentric.

21. (Currently Amended) The static interferometer of claim ~~12~~13, wherein the optical system also focuses the separate beams of light emerging from the beam shearing system to create an image.

22. (Previously Amended) The static interferometer of claim 21 wherein:

the optical system has an optical axis;

the exit pupil is located in one of the group consisting of a tangential plane and a sagittal plane relative to the beam shearing system;

the image is located in the other of the group consisting of a tangential plane and a sagittal plane relative to the beam shearing system; and

the exit pupil and the image are located at substantially the same position along the optical axis.

23. (Original) A beam shearing system comprising:

an entrance slit structure having an entrance slit extending in a first direction for receiving a beam of light having a photon flux within a predetermined spectral pass band;

a beam splitter aligned at an angle to the first direction so that the received beam of light is split into two separate beams;

a reflective subsystem having a plurality of reflective surfaces defining separate light paths of equal optical path length for the two separate beams, the reflective surfaces arranged such that one of the separate beams undergoes one reflection and the other of the separate beams undergoes three reflections and that when the two beams emerge from the beam shearing system they contain more than 50 percent of the said photon flux.

24. (Previously Amended) A static interferometer comprising:

fore-optics for collecting light and collimating into a beam, the fore-optics possessing an exit pupil;

a beam shearing system comprising:

an entrance slit structure having an entrance slit extending in a first direction for receiving a beam of light having a photon flux within a predetermined spectral pass band;

a beam shearing system comprising:

a beam splitter aligned at an angle to the first direction so that the received beam of light is split into two separate beams;

a reflective subsystem having a plurality of reflective surfaces defining separate light paths of equal optical path length for the two separate beams, the reflective surfaces arranged such that

one of the separate beams undergoes one reflection and the other of the separate beams undergoes three reflections and that when the two beams emerge from the beam shearing system they contain more than 50 percent of the said photon flux; and

a detector located at said exit pupil where the two beams emerging from the beam shearing system converge.

25. (Previously Amended) The static interferometer in claim 24 wherein the detector comprises a detector array, read out electronics and a data processing system.

26. (Previously Amended) The static interferometer in claim 25 wherein:

the detector array records the intensity of the radiation incident on its pixels;

the read out electronics digitizes the intensity measurements made by the detector array and transfers them to the data processing system; and

the data processing system manipulates the digitized measurements to obtain information about the spectrum of the incident radiation.

27. (Previously Amended) The static interferometer in claim 26 wherein the data processing system performs Fast Fourier Transforms on the digitized measurements to obtain the spectral composition of the incident radiation.

28. (Previously Amended) The static interferometer in claim 27 wherein the data processing system convolves the digitized measurements with digital filters to detect the presence or absence in the spectrum of the incident radiation of frequencies of radiation characteristically emitted or absorbed by particular substances.

29. (Original) The static interferometer in claim 24 which further comprises:

an anamorphic optical system possessing an optical axis;

the exit pupil being perpendicular to the optical axis;

the optical system focusing the two beams emerging from the beam shearing system to create an image; and

the image being perpendicular to the exit pupil and perpendicular to the optical axis.

30. (Currently Amended) The beam shearing system of claim ~~5~~ 23, wherein an air gap exists between the beam splitter and one of the bodies.

31. (Currently Amended) The static interferometer of claim ~~12~~13, wherein the fore-optics have an asymmetric pupil and are telecentric in image space.

32. (Previously Added) The static interferometer of claim 30, wherein the fore-optics are constructed using a single lens, two or more lenses, a configuration of mirrors or catadioptric systems.

33. (Currently Amended) A beam shearing system for shearing an incident beam of light having a chief ray, comprising:

a first prism possessing a ~~first~~ surface acting as a beam splitter;

a second prism positioned to create an air gap between the second prism and the ~~first~~ surface;

wherein the first and second prisms are positioned such that the incident beam of light is incident on the ~~first~~ surface at an angle that substantially prevents total internal reflection;

wherein the incident beam of light is split by the beam splitter into two separate beams of light that emerge from the beam shearing system; and

wherein the two beams of light are substantially parallel when they emerge from the beam shearing system and contain more than 50% of the incident light.

34. (Currently Amended) A beam shearing system for shearing an incident beam of light having a chief ray, comprising:

a first prism possessing a surface acting as a beam splitter;

a second prism positioned to create an air gap between the second prism and the surface;

wherein the first and second prisms are positioned such that the incident beam of light is incident on the surface at an angle that substantially prevents total internal reflection;

wherein the incident beam of light is split by the beam splitter into two separate beams of light that emerge from the beam shearing system; and

wherein the two beams of light are substantially parallel when they emerge from the beam shearing system and contain more than 50% of the incident light; and

~~The beam shearing system of claim 33,~~ wherein both the beams of light emerging from the beam shearing system include infrared radiation.

35. (Currently Amended) A beam shearing system for shearing an incident beam of light having a chief ray, comprising:

a first prism possessing a surface acting as a beam splitter;

a second prism positioned to create an air gap between the second prism and the surface;

wherein the first and second prisms are positioned such that the incident beam of light is incident on the surface at an angle that substantially prevents total internal reflection;

wherein the incident beam of light is split by the beam splitter into two separate beams of light that emerge from the beam shearing system; and

wherein the two beams of light are substantially parallel when they emerge from the beam shearing system and contain more than 50% of the incident light; and

~~The beam shearing system of claim 33,~~ wherein both the beams of light emerging from the beam shearing system include ultraviolet radiation.

36. (New) The beam shearing system in claim 23 wherein the two beams emerging from the beam shearing system contain substantially all of the light entering the system through the entrance slit.

37. (New) The beam shearing system in claim 23 wherein the two light paths defined by the reflective subsystem cause the wave fronts of the two separate beams to remain substantially in phase relative to one another when the beams emerge from the beam shearing system.

38. (New) The beam shearing system in claim 23 wherein the plurality of reflective surfaces are further arranged so that the separate beams of light are of substantially equal intensity, when they emerge from the beam shearing system.

39. (New) The beam shearing system in claim 23 wherein:

the reflective subsystem comprises a plurality of bodies with a beam splitter therebetween; and

the entrance and exit surfaces of the plurality of bodies are substantially perpendicular to the chief ray of the received beam of light.